

# Aircraft Evacuation Simulation

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Federal Aviation  
Administration



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Administration

# Introduction

- **David Weed, M.A.**
  - Cabin Safety Research Team
  - Civil Aerospace Medical Institute (CAMI)
  - FAA



# Disclaimer

- **The views and opinions expressed in this presentation are not those of the U.S. Government, the Department of Transportation, or the Federal Aviation Administration.**
  - I am a researcher
  - I require data
    - Historical
    - Empirical
    - “I don’t know”
    - “It depends...”



# Aircraft Evacuation

- **14 CFR 25.803 – Emergency Evacuation**
  - Paragraph C
    - Must be shown that the fully loaded aircraft can be completely evacuated in under 90 seconds.
    - Compliance must be shown by actual demonstration... unless the Administrator finds a combination of analysis and testing will provide data equivalent to that which would be obtained by actual demonstration



# Aircraft Evacuation

- **AC 25.803-1A – Emergency Evacuation Demonstrations**
  - 03/12/12
  - Supersedes -1, dated:11/13/89
- **Limitations of current method**
- **Computer modeling**
  - **10. Computer Modeling.** Work is being done in the field of computer modeling to develop programs which could be used to demonstrate compliance with the evacuation demonstration requirements. Although progress has been made, to date, no program has been presented to the FAA and found acceptable as a substitute for an actual demonstration. Any applications for the use of computer modeling to demonstrate compliance with § 25.803(c) should be coordinated with the Standards Staff of the Transport Airplane Directorate.



# History

- **Proposal in 1978**

- Garner, J.D., Chandler, R.F., & Cook, E.A. (1978, April). GPSS Computer Simulation of Aircraft Passenger Emergency Evacuations. Report number FAA-AM-78/23.

- **International Fire & Cabin Safety Research Conference**

- 1995
- Future CSRT plans
- Presentations
  - K. Romi Singh, Aviation Research Corp.
  - Edwin R. Galea, University of Greenwich



# Current Project

- **Evacuation Analytical Tools**
- **Model: EVA**
  - H.C. Gea, Rutgers University
  - Development and calibration
  - Features
  - Algorithm Overview
  - Limitations
- **Alternatives**



# Current Understanding

- **Step One**
  - Develop a model
- **Step Two**
  - Magic Happens
- **Step Three**
  - Use Modeling/Simulation for Certification/Accident Investigation





# Future Work

- **Verification and Validation**

- Data Gathering: FlexSim and 747 AERF
- EVA
- Alternative models

- **Ultimate Goal**

- Revise AC 25.803-1A to allow the use of computer modeling for certification.



# Finally

- **Questions?**
- **Comments?**
  
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